Selected Abstracts from the May Issue of the European Journal of Vascular and Endovascular Surgery

Jean-Baptiste Ricco, MD, PhD, Editor-in-Chief, and A. Ross Naylor, MBChB, MD, FRCS, Senior Editor

Outcome After 7 Years of Carotid Artery Stenting and Endarterectomy in Sweden – Single Centre and National Results

Lindström D., Jonsson M., Formgren J., Delle M., Rosfors S., Gillgren P. Eur J Vasc Endovasc Surg 2012;43:499-503.

Objectives: The aim was internal vascular centre quality-control measures to compare single-centre results with the national perspective, as well as Analysing the Swedish results from carotid artery stenting (CAS) and comparing a relatively high-volume single centre with the Swedish Vascular Registry (Swedvasc) data. The second aim was to compare CAS and carotid artery endarterectomy (CEA) outcomes for the same 7-year period.

Design: Retrospective review of a single high-volume centre (Södersjukhuset (SöS)) (approximately 30 CAS year^{-1} approximately 90 CEA year^{-1}) versus Swedvasc National data.

Materials and methods: All consecutive selective patients treated with CAS at SöS for a stenosis of the internal carotid artery ($n = 208$) or CEA ($n = 552$) between 2004 and 2011 were compared with all patients in Swedvasc registered for CAS ($n = 258$) and CEA ($n = 6474$). Primary outcome was 30-day frequency of stroke or death. Secondary outcome was stroke/death/acute myocardial infarction (AMI).

Results: The 30-day frequency of any stroke or death after CAS at SöS compared to the national data was 2.9% and 7.4%, respectively ($P = 0.04$). The 30-day AMI/stroke/death frequency was 3.4% and 9.5%, respectively ($P = 0.01$). After CEA during the same time period, the Swedvasc national data had a 4.4% frequency of 30-day stroke and death and 5.8% for AMI/stroke/death.

Conclusions: CAS is not as safe as CEA from a national perspective but our results indicate that a single centre can achieve acceptable results with CAS.

Endovascular Repair of Abdominal Aortic Aneurysm does not Improve Early Survival versus Open Repair in Patients Younger than 60 Years

Gupta P.K., Ramanan B., Lynch T.G., Gupta H., Fang X., Balters M., Johanning J.M., Longo G.M., MacTaggart J.N., Pipinos I.I. Eur J Vasc Endovasc Surg 2012;43:518-24.

Objectives: Multiple randomised trials have demonstrated lower perioperative mortality after endovascular aneurysm repair (EVAR) compared to open surgical repair for infrarenal abdominal aortic aneurysms (AAAs). However, in these trials the mortality advantage for EVAR is being lost within 2 years of repair and the patients evaluated are relatively older with no study specifically comparing EVAR and open repair for patients younger than 60 years of age.

Design: A retrospective analysis of prospectively collected data.

Materials and methods: Patients younger than 60 years of age who underwent EVAR and open surgical repair for elective infrarenal AAA were identified from the 2007–09 National Surgical Quality Improvement Program (NSQIP) – a prospective database maintained at 237 centres across the United States. Univariate and multivariate analyses were performed.

Results: Of the 651 patients, 369 (56.7%) underwent EVAR and 282 (43.3%) underwent open repair. Thirty-day mortality for EVAR and open repair were 1.1% and 0.4%, respectively. This was not significantly different on univariate ($P = 0.22$) as well as multivariate ($P = 0.69$) analysis after controlling for other co-morbidities. On multivariate analysis, body mass index, history of stroke and bleeding disorder prior to surgery were associated with a higher 30-day mortality after AAA repair (combined open and EVAR).

Conclusions: These contemporary results demonstrate that the 30-day mortality rate after open repair is similar to that after EVAR in patients younger than 60 years with infrarenal AAA.

Measuring the Maximum Diameter of Native Abdominal Aortic Aneurysms: Review and Critical Analysis

Long A., Rouet L., Lindholt J.S., Allaire E. Eur J Vasc Endovasc Surg 2012;43:527-36.

Objectives: Maximum diameter is a determinant parameter for the clinical management of asymptomatic abdominal aortic aneurysm (AAA). However, its measurement is not standardised. We review the different methods used to measure AAA maximum diameter, with ultrasound (US) or computed tomography (CT).

Methods: A review of maximum diameter measurement methods with US and CT was performed, focussing on screening, surveillance before repair and decision for intervention. Diameter measurement methodology was described according to four parameters: plane of acquisition, axis of measurement, position of callipers and selected diameter. A quality score to evaluate methodology descriptions was defined (plane, axis, callipers placement and selected diameter), ranging from 0 (worst) to 4 (best).

Results: Review showed a wide range of definitions and practices. The mean value of the quality score was 2.52 in screening studies, 1.66 in guidelines for screening, 2.81 in follow-up studies and 1.63 in studies describing decision for intervention.

Conclusion: To improve the efficiency of AAA management (in screening programmes, follow-up and decision for intervention), and enable comparison between future studies, a standardised methodology for AAA maximum diameter measurement is necessary. Until such a consensus is reached, publications should at least clearly report the method of measurement.

Treatment of Aortic Arch Aneurysms with a Modular Transfemoral Multibranched Stent Graft: Initial Experience

Lioupis C., Corriveau M.-M., MacKenzie K.S., Obrand D.I., Steinmetz O.K., Abraham C.Z. Eur J Vasc Endovasc Surg 2012;43:537-44.

Objectives: To present initial experience with a new modular transfemoral multibranched stent graft for treating aortic arch aneurysms.

Methods: Six patients, considered high risk for open surgery, were treated with custom made branched stent grafts. All patients had a staged left carotid subclavian bypass before the endovascular procedure. Each branched graft had a 12 mm side branch for the innominate artery and an 8 mm side branch for the left common carotid artery.

Results: Four patients out of six had uneventful placement of the prostheses, with successful exclusion of their aneurysms. One patient developed a type I endoleak that was managed successfully with coiling and gluing of the aneurysm sac. In one patient, cannulation of the innominate branch was unsuccessful and an extra-anatomic bypass was necessary to perfuse the right carotid and vertebral arteries. This patient developed a stroke, while one more suffered a right cerebellar infarct.

Conclusion: We have demonstrated the technical feasibility of a modular transfemoral branched stent graft for treatment of aortic arch aneurysms. The method is relatively safe based on initial experience. More cases and long-term follow up are necessary to evaluate the efficacy and safety of this new device.

Measurement and Optimization of Patient Radiation Doses in Endovascular Aneurysm Repair

Walsh C., O'Callaghan A., Moore D., O'Neill S., Madhavan P., Colgan M.P., Haider S.N., O'Reilly A., O'Reilly G. Eur J Vasc Endovasc Surg 2012;43:546-51.

The study assessed radiation exposure during EVAR. Two types of patient dose were estimated: effective dose (ED), which allows estimation of radiation risk to the EVAR patient population; and Peak Skin Dose (PSD), which allows us assess the potential for an individual patient to receive a radiation skin injury. An ancillary aim was to examine dose optimization in EVAR procedures.

Based on 111 EVAR cases we estimated average ED as 12.4 mSv. Cumulative patient dose in our centre was lower than other studies because the follow up of EVAR patients is based on ultrasound rather than CT. PSD calculated using a published conversion formula closely matched measurements with calibrated gafchromic film. 99% of patients had an estimated PSD of < 2Gy. Results indicate that skin injuries are possible, but very unlikely in EVAR procedures at our centre.

EVAR is a high dose procedure and emphasis on dose optimisation is important. We broke the EVAR procedure into 15 steps and, in a phantom study, showed how skin dose changes as procedure steps are varied. The resulting dose matrix has the potential to be used as an educational tool to promote dose optimization.

Predictors of Early Graft Failure After Infrainguinal Bypass Surgery: A Risk-adjusted Analysis from the NSQIP

Lancaster R.T., Conrad M.F., Patel V.I., Cambria R.P., LaMuraglia G.M. Eur J Vasc Endovasc Surg 2012;43:580-6.